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CANADA

OUTDOOR GARDENING
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Outdoor Gardening

Vegetable Gardens

4-H MOTTO

"LEARN TO DO BY DOING"

4-H PLEDGE

I PLEDGE MY HEAD, TO CLEARER THINKING,
MY HEART, TO GREATER LOYALTY,
MY HANDS, TO LARGER SERVICE,
AND MY HEALTH, TO BETTER LIVING.
FOR MY CLUB, MY COMMUNITY, AND MY COUNTRY.

4-H GRACE

(Tune of Auld Lang Syne)

WE THANK THEE, LORD, FOR BLESSINGS GREAT
ON THIS, OUR OWN FAIR LAND.
TEACH US TO SERVE THEE JOYFULLY,
WITH HEAD, HEART, HEALTH, AND HAND.

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OUTDOOR GARDENING

Gardening is an exciting and rewarding project. It is fun to sow seeds, set out plants, watch them grow, and harvest the produce.

The 4-H vegetable gardening project is divided into three sections: *Beginning*, *Advanced*, and *Variety* gardening. The beginning vegetable project is designed to help the new gardener learn the basic techniques of gardening -- planting, care, and harvesting. The advanced garden project is concerned with growing more challenging vegetables, transplanting, and pruning. The variety gardening is for senior members. It involves choosing a specific gardening project with the leader's assistance and carrying out a study of the project.

In the vegetable gardening project, it is not necessary to start with the beginning project. If you have had previous experience with gardening, talk to your leader who will help you decide which project area is most suitable for you.

BEGINNING VEGETABLE GARDENING

1. You are required to grow a minimum of ten kinds of vegetables, all of which must be started as seeds in the garden. (No transplanting of seedlings may be done.) Your leader will help you choose the vegetables, which must include:

   Three root vegetables (e.g. carrots, radishes, beets)
   Two leafy vegetables (e.g. lettuce, spinach)
   Two vine vegetables (e.g. peas, beans)
   Three of your own choice.

2. Exhibit five vegetables at Achievement Day for judging. Include two root vegetables, one leafy, one vine, and one of your own choice.

3. Make an attractive exhibit for Achievement Day, using all the vegetables available in your garden.

4. Display your completed garden record at Achievement Day.

5. Prepare a dish using a vegetable chosen by members to exhibit and sample at Achievement Day, OR identify and mount five weeds from your garden and display them.

ADVANCED VEGETABLE GARDENING

1. You are to grow a minimum of seven vegetables. Three varieties must be transplanted as seedlings to the garden (e.g. tomatoes, cabbage, cauliflower). Of the seven vegetables grown, three must require special care such as pruning or bug powders. If the transplanted vegetables need special care, they can be used. Other varieties requiring special attention may be used.

2. Three vegetables must be displayed at Achievement Day for judging.

3. Choose two of the following:

   i) Preserve two types of vegetables by freezing OR

   ii) Construct a frame which is useful for gardening, e.g. cold frame, storage box, etc. OR

   iii) Identify four insects found in the garden, and two diseased or damaged plants. Show change after treatment. Mount and display OR

   iv) Prepare one salad plate and one relish tray using the principles of good diet and attractiveness.

4. Prepare a display of all vegetables in your garden for Achievement Day.

5. Prepare two dishes using vegetables in a new or unusual way. Exhibit and sample.

VARIETY GARDENING

1. Grow at least three varieties of a vegetable and do a study of the project including differences noted in varieties -- shape, colour, harvesting, cooking properties. Samples of the vegetables and your study are to be displayed at Achievement Day OR choose your own project (e.g. fertilizer tests, gardening, and vegetable growing for commercial reasons, landscaping, lawn care, small fruits, grafting). Do a study on your project to be displayed at Achievement Day.

2. Judge three kinds of vegetables (refer to Page 63).

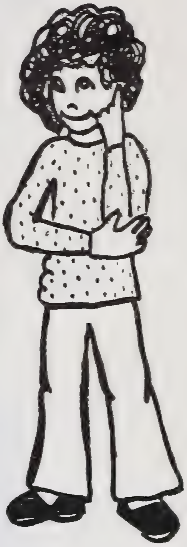
3. Display your completed garden record at Achievement Day.

4. Preserve garden vegetables or small fruits by preparing relish, pickles, jam, or jelly.

5. Prepare two dishes using vegetables other than as a side dish or a salad.

PLANNING THE GARDEN

Find the right place for your garden. It should be a place .....



1. With good *SOIL*. "The best is none too good," when it comes to finding the right place for the vegetable garden. Try to find soil that is loose, fertile, and well drained. But almost any soil, if it is handled correctly will grow healthy vegetables.

2. That's *HANDY*. "Not too far from the house," is a sensible idea. Then, if you have just a short time, you're more likely to go out to work in the garden.

3. That's *LEVEL*. If the garden spot is level, the soil will not wash away as easily as it does on sloping ground. If there is a gentle slope to the south or to the southeast, the vegetables may reach maturity a bit earlier.

4. That's *SUNNY*. Vegetables need full sunshine most of the day. So have your garden where trees, buildings, fences, and shrubbery will not shade it.

5. That's *PROTECTED FROM WINDS*. The area should be protected on the north and west in particular. However, the vegetables should be far enough from the shelter so that the trees do not shade the garden nor take moisture from it.

GARDEN ARRANGEMENT

Start your garden in January -- on paper. You will need a plan for your garden just as engineers need a blueprint for a building. Experienced gardeners may be able to keep a plan in their minds, but most will need a real working garden map. This is especially important to save space.

SPACE SAVERS

Many 4-H garden members do not have space to expand their gardens from year to year. They must grow as much as they can in a small space. This is called *Intensive Gardening*. The following practises may help you use land more efficiently:

1. Succession planting--follow a quick-maturing crop like lettuce with a late crop like cabbage in the same area.

2. Intercropping--plant a quick-maturing crop that requires narrow spacing (e.g. radishes or early cabbage) between rows of crops requiring wide spacing (e.g. squash or cucumbers).

3. Companion cropping--sow (thinly) an early-maturing crop like radishes in the same row as a late maturing, slow germinating crop such as parsnips. This will aid germination and will make cultivation easier.

4. Staking or trellising--to conserve space, use these supports for such crops as tomatoes, pole beans, and vine crops.

If space is very limited you may want to incorporate vegetables in the flower border. Many vegetables lend beauty to the landscape setting. Tall plants like sweet corn and staked tomatoes can be in the background. Beets, carrots, and lettuce are quite ornamental and can be used near the front of the border.

PLANNING HINTS

Here are a few pointers to remember as you work out a rough garden map:

1. Make all rows straight and parallel.

2. If you use power equipment, make the rows long to avoid unnecessary turning around. If you hand cultivate, short rows are less monotonous to work.

3. On a slope, run rows along the contour or across the slope.

4. Arrange the crops so that tall plants like sweet corn and pole beans do not shade the small plants.

5. Put perennial vegetables like asparagus and rhubarb along the small fruits on one side of the garden where they will not interfere with garden preparation.

6. Group the crops according to the time they mature to facilitate succession plants, rotation, or planting of fast maturing crops after harvest of the early crop.

7. Vine crops like melons, squash, and cucumbers can be planted on one side so they can spread into the fence row.

8. Do not crowd the plant; allow ample room for each vegetable to develop.

In the farm garden, where there is usually plenty of room, the rows should be about 3 feet apart. This makes it possible to use a garden cultivator to control weeds. Actually, a spacing greater than three will be needed for cucumbers, squash, and other vines, since they will spread out on either side of the row. No vegetables should be planted closer than 25 or 30 feet from a row of trees. The spacings to be used in the vegetable garden should depend upon the methods of culture, the abundance or scarcity of the land, and the supply of moisture. As previously mentioned, the rows should be about 3 feet apart for machine cultivation. Where natural moisture supply is greatly restricted, the minimum distance between rows may be 4 feet or even more. The spacings in the row should be sufficient to allow each plant to develop properly.

In small vegetable gardens, where cultivating is to be done by hand and where irrigation methods are to be followed, the distance between the rows may be reduced to 12 inches. This is possible where a long-season crop, such as parsnips, is grown in rows 24 inches apart, and rows of short-season crops such as radishes and early carrots, are grown in between the rows of the former. Where such cropping is not to be practised, the minimum distance between rows is about 18 inches.

9. Do not plant too much of such crops as chard, leaf lettuce, and parsley. By removing a few leaves from each of several plants instead of harvesting an entire plant, you will encourage them to produce a continuous supply of high quality produce over a longer period.

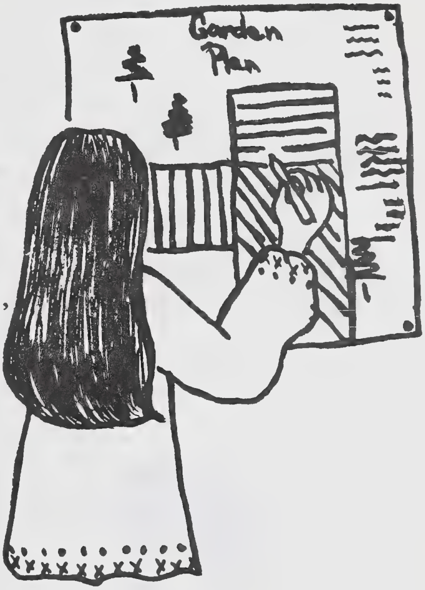
10. Plant sweet corn in blocks of two or more rows so that good pollination of the ears can take place. *Pollination* is the transfer of pollen grains from the tassel to the silk on the ears and is necessary to produce good plump kernels. Pollen grains are formed in the tassel at the top of the plant and contain the male sex cells. The pollen grains are carried by wind from the tassel to the silk at the tip of the corn ear. When a pollen grain falls on a silk, it sprouts and then makes cells move down inside the silk until they reach the young kernel at the end of each silk. Then one of the male sex cells unites with the female sex cell *(Fertilization)*.

After fertilization, the young kernel starts to develop. If the young kernel isn't fertilized, it shrivels up. This is why it is important to have good pollination.

If you plant sweet corn in a single row, a crosswind may blow the pollen grains away from the silk. Then all the silks will not be pollinated, resulting in ears of corn that have many shrivelled kernels. If you have several short rows of sweet corn, a crosswind will carry pollen grains to the next row of corn and so, provide better pollination.

A working garden map or plan is essential in the planning process. Include a copy of your garden plan in your record book (refer to page 65). It will prove most helpful. A *garden map* should be:

1. Drawn to scale,
2. Show the size of the garden,
3. Show spacing between rows, crops, and varieties to be planted,
4. State the date of planting,
5. Show the length of each row of crops,
6. Rows should be correctly labelled,
7. Show the plan for successive plantings,
8. Give the general arrangement of the crops,
9. Indicate the North, South, East, and West sides of the garden.



WHAT TO GROW

Once you know the project requirements, you can choose the vegetables you want to grow.

When deciding what to plant, consider the size of the garden. In small gardens, select vegetables such as lettuce, chard, onions, snap beans, or tomatoes, that yield a lot in a little space.

Consider, too, the likes and dislikes of your family. Plant crops that will give the highest nutritive returns.

The selection of adapted varieties for Alberta is a simple but important step to a successful garden. The varieties which are grown in southern Ontario may not suit Alberta's climate and soil conditions. Varieties differ in growth. Some require more room than others. Some are better for certain uses and others are more resistant to disease.

Each year a new list of recommended varieties is published by the Alberta Department of Agriculture. Ask your District Agriculturist for a copy of the Alberta Horticultural Guide. Order your seed early from reliable seed companies. New varieties disappear from the seed store shelves early in the spring.

DON'T SAVE SEED

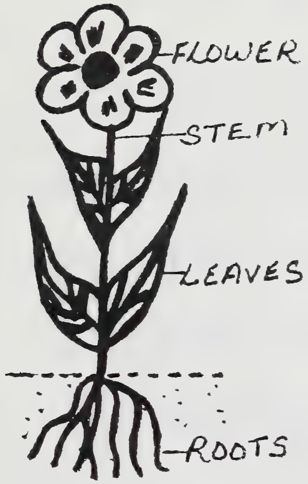
Generally, it is wiser to buy fresh seeds each year than to try to save seed from your garden. Many vegetable crops are cross-pollinated. Some of these are corn, cucumber, melon, pumpkin, squash, onion, spinach, radish, beet, turnip, and cabbage. Seeds saved from these crops will not produce true to type. Sweet corn will cross with field corn so it is not wise to save sweet corn seed if field corn is grown nearby. Hybrid sweet corn or any other hybrid vegetables should not be saved for seed because the resulting plant usually will not be the same.

Some seeds retain the ability to grow longer than others. Seeds of corn, onions, parsley, and parsnips are relatively short-lived and usually not good after one or two years. Beet, cucumber, muskmelon, eggplant, and tomato seeds last at least five years.

PARTS OF PLANTS AND WHAT THEY DO

It is important to know something about plants in order to garden intelligently. After reading this section, you should know why you add fertilizer to the soil, why you water your garden, why you locate your garden in the sun, and many other things.

Plants have four basic parts: *ROOTS*, *STEMS*, *LEAVES*, and *FLOWERS*.



THE PARTS OF A PLANT

Flowers contain the reproductive parts of a plant and produce seeds.

Roots, stems, and leaves are called live parts and are necessary for making the plant grow.

THE ROOTS

Roots anchor the plant in the soil.

They take up water and nutrients from the soil. *A Nutrient* is a mineral element such as phosphorous that a plant needs for normal growth just as your body needs iron and calcium and other minerals.

Roots carry water and nutrients taken in from the soil upward into the stem of the plant.

They store the food that is made in the leaves during the daytime.

We eat the roots of some vegetables: carrots, beets, parsnips, radishes, and rutabagas.

THE STEM

Stems produce and support the leaves of the plant and its flowers in the same manner as our bones help make and support our bodies.

They contain pipelines to carry water, nutrients, and food to all parts of the plant.

We eat the stem of vegetables such as asparagus and kohlrabi. Sometimes these stems are underground, such as the potato tuber.

THE LEAVES

Leaves make food for the plant by combining carbon dioxide (a gas) from the air with water from the soil. This process is known as *Photosynthesis*. It occurs in all green leaves in the presence of light. All the food we eat comes either directly from plants or in the form of meat, fish, eggs, milk, and other products produced by animals which consume green plants.

We eat the leaves of some vegetables, e.g. onions, cabbage, lettuce, spinach.

THE FLOWERS

Flowers produce fruit and seeds. A seed contains a tiny plant which will start to grow under the proper conditions.

We eat the flower parts of broccoli and cauliflower, and we consume the fruit of many vegetables: cucumbers, tomatoes, melons, peppers, and snap beans. We eat only the seed of some vegetables: peas, lima beans, and dry beans.

TOOLS NEEDED FOR A GARDEN

You will probably find most of the tools and supplies you will need for your garden at home.

You will need:

1. A *SPADE* or *SPADING FORK* or *TILLER* for turning the soil over and breaking up the large lumps of soil.

2. A *RAKE* to smooth the soil surface, cover seeds, and clean up.

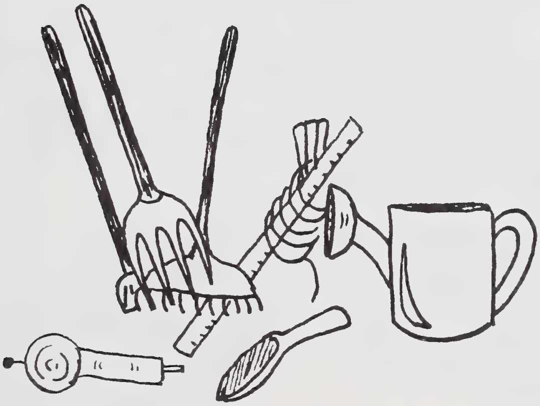
3. A *YARDSTICK, STRING, STAKES,* and *LABELS* for getting the rows straight and for labelling them.

4. A *TROWEL* or *SMALL HAND SPADER* for working close to the plants and for transplanting.

5. A *GARDEN HOE* for killing weeds and loosening the soil, opening trenches, and covering seeds.

6. A *SPRINKLING CAN* or *WATER HOSE* for watering the garden in dry weather.

7. An inexpensive *HAND DUSTER* or *SPRAYER* for pest control.



PREPARATION OF THE GARDEN PLOT

SOIL AND SOIL PREPARATION

Soil is very important to plant growth. The soil provides food, water, and air for the plant roots and, also, supports the plant, holding it up to the light.

Deep, black loam soils are the best type of soils. Moisture soaks in well and is retained so that plant roots have a good supply of water. Loam soils, also, warm up quickly in the spring and are easy to work. Sandy loam would be the next choice. It is more desirable than sandy, gravelly, or clay soil. Sandy and gravelly soils contain a limited amount of plant food and dry out too quickly. Clay coils are cold, warm up very slowly, and are difficult to work.

Proper care must be given to the soil if it is to produce a good garden. A garden should be spaded to a depth of *7 to 8 inches* in order to:

1. Loosen the soil,

2. Turn under manure, remains of old crops, and other materials,

3. Let air and moisture pass through soil more easily.

All gardens, except those with very light soil should be ploughed in the fall and left in a rough state over winter. If a garden is ploughed in the fall, the frost helps to break up the lumps and puts the soil in good condition. A good application of well-rotted barnyard manure or other organic material should be put on before ploughing is done.

If fall ploughing is impossible, the garden should be ploughed in the spring as soon as the soil is warm and dry enough. Never work the soil when it is wet. (The soil is too wet to work if it sticks to your shoes.) This causes lumpy, hard, and compact soil and small roots will not be able to grow.

IMPROVING GARDEN SOIL

Plants obtain foods necessary for their growth from the air and the soil. Three foods not supplied by air by by soil only are *NITROGEN (N)*, *PHOSPHOROUS (P)*, and *POTASH* or *POTASSIUM (K)*. The soil does not contain an unlimited supply of these nutrients. Each time a crop is harvested, part of the supply is removed from the soil. Commercial fertilizer and organic matter are used to return these nutrients to the soil.

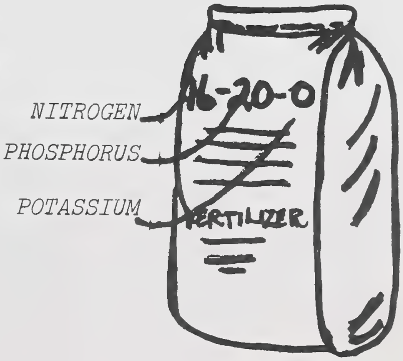
The best treatment for a garden is a heavy dressing of barnyard manure each year. As well as supplying plant food, manure helps to conserve moisture. If barnyard manure is applied to heavy soil, it is easier to work. If it is available, use three to four bushels per 100 square feet and work it thoroughly into the garden plot.

Other organic materials are:

1. Half-rotted leaves,
2. Peat,
3. Half-rotted sawdust,
4. Crop residues including corn stalks, pea vines, etc.
5. Compost pile or pit. Compost piles can be made by piling up plant refuse in shallow layers with small amounts of garden soil and commercial fertilizer sprinkled between. The pile should be kept damp and turned occasionally as it decays. Compost will be ready for garden use in six to eight months after it is started. It should be spread and ploughed or spaded into the soil in the same manner as barnyard manure.

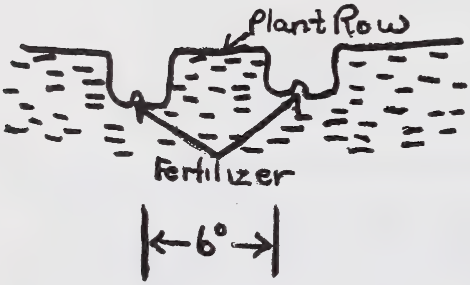
PLANT FOOD

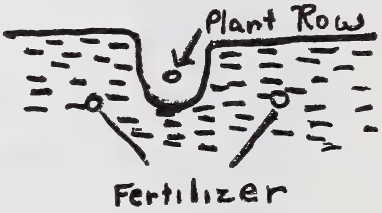
In addition to organic matter, the soil should contain plenty of readily available nutrients for the plants. These are best supplied by the use of liberal applications of manure plus superphosphate or other commercial fertilizers. Almost any complete commercial fertilizer is suitable for the vegetable garden.



Most commercial fertilizers come in 60 pound bags. The most common type in Alberta is *16-20-0*, which contains *16% Nitrogen* and *20% Phosphoric Acid*. The *0* indicates that there is no potassium, although it is present in some fertilizer formulae. The remaining *64%* is *carrier material*, required to carry the primary plant nutrients in the bag. This carrier material may, also, contain secondary and trace elements. The analysis on the bag states what the fertilizer contains.

The fertilizer should be worked into the soil to a depth of *one* to *two inches* with a harrow or rake. Commercial fertilizer can, also, be applied as a side dressing when seeds are planted. Apply the fertilizer in a furrow *two* or *three inches* deep and the same distance on either side of the row. This method is especially good when intensive gardening is practised and when succession or fall crops follow early planted ones. Be careful that the fertilizer does not come in direct contact with roots or tops, since it may cause burning of the young plants.





PLANTING THE GARDEN

COOL-SEASON CROPS

Some vegetables can be seeded directly into the garden at the same time as the garden is prepared. These are known as *cool-season crops*. Vegetables such as leaf lettuce, radishes, peas, spinach, and kohlrabi cannot endure hot weather, but reach edible maturity so quickly that they can be planted in the open ground early enough to attain full development before hot weather.

Some cool weather crops have so long a growing season that they usually must be transplanted in order to reach their edible maturity before hot weather. Cabbage and cauliflower belong to this category.

Long-season vegetables requiring cool, moist conditions during early development, but capable of enduring heat and dry weather after becoming well-established are beets, carrots, parsnips, and onions.

WARM-SEASON CROPS

Warm-season vegetables are those that need warm soil conditions for germination and growth. They are very sensitive to cool air and soil temperature. Some warm-season crops with a short enough growth period to enable them to mature in temperature regions during warm weather are: beans, sweet corn, popcorn, cucumbers, squash, and pumpkins.

Other warm-season crops require so long a growing season that in northern regions they usually must be started under glass and then transplanted to the field when conditions become favourable. Tomatoes, eggplants, and peppers are examples. Sometimes early varieties of tomatoes may be seeded directly in the garden in May.

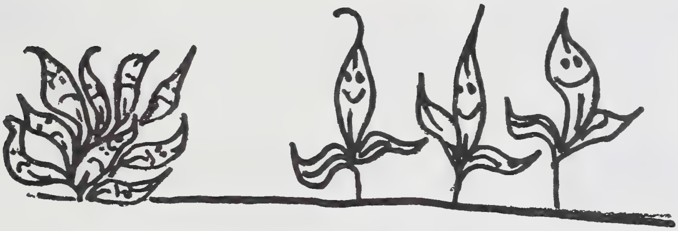
SOWING THE SEED

Select a mild day for sowing the seed. Begin on one side of the plot and place the first row as suggested in your garden plot. Place the twine where the first row is to be, stretch it as tight as possible and with the corner of the hoe or other implement, draw out a V-shaped furrow to the required depth. The depth of the furrow will depend on the size of the seeds, amount of moisture, and type of soil. For the very fine seeds such as onions, radishes, turnips, lettuce, and carrots very shallow seeding should be done. If these fine seeds are planted too deeply they are unable to grow up through the soil. The larger seeds can be planted at a depth about four times the diameter of the seeds.

As each row is planted, the seeds should be covered to conserve the moisture in the soil. If the soil is very dry, dampen it, since moisture at germination time is essential for germination. A stake should be put up at the end of each row as it is planted. Label the stake with the name and variety of vegetable. Using stakes and labels, it is much easier to weed between the rows before the vegetable plants appear.

THINNING

It is very difficult to sow small seed thinly enough to permit all plants to develop well. Surplus plants are just like weeds and should be removed.



CROWDED PLANTS DO NOT GROW WELL.

Thinning is hard work and is best done soon after plants germinate. When the soil is moist, the surplus plants can be removed easily without injuring the remaining ones. Early thinning is especially important in root crops like *carrots*, *parsnips*, *beets*, *rutabagas*, *onions*, and *turnips*. Thinnings of lettuce and chard can be used as food. Radishes and onions can be left in the ground until those that are to be thinned are large enough to eat.

Where several seeds are planted in hills, the plants must be thinned after germination. Thin *corn*, *cucumbers*, *melons*, and *squash* to three (3) plants per hill. The best time to do this is when the seedlings have developed the first pair of true leaves. When thinning, remove the smaller seedlings and keep those which look like they are the strongest and healthiest.

TRANSPLANTING

Vegetables which would not normally mature in our climate may be grown in Alberta gardens by transplanting. Vegetables such as *tomatoes*, *cabbage*, and *cauliflower* are usually transplanted. You can start the plants indoors, or in a cold frame, or you can buy bedding plants when your garden is ready and the danger of frost is past. Transplanting consists of moving the seedling plants from their first container to another place, usually the garden.

If you wish to start the plants yourself, your leader will be able to tell you how. It is much simpler to buy bedding plants. Obtain the plants from a reliable nursery or store. Select plants that are healthy, not over crowded or spindly, well coloured, and not wilted.

Do not transplant your seedlings into the garden immediately. Allow them to become accustomed to the garden climate gradually by setting the container outdoors in a sheltered spot during the day. Bring the plants in again at night or if it is stormy. After a week of hardening, the plants will be adjusted to the outdoors and will be ready to move to the garden.

Move plants into the garden on a cloudy day, or in the evening. When transplanting, try to keep as much soil around the roots as possible. If flats or trays have been used, squares of soil are cut out with the plant and the entire unit is transplanted. A better procedure is to do this cutting, often referred to as *blocking*, one week to ten days before actual transplanting. This is a root pruning procedure and new root hairs will be well initiated within the "block" by transplanting time. The soil should be moist at the time of removal so that it will not crumble.

The plants started in individual clay pots can be knocked out and the ball of soil around the root mass planted intact. Seedlings should be planted at the same level or slightly lower than they were in the container. Place the seedling in a prepared hole and press the soil firmly around the roots.

The ground should be moist so that the seedling will get a good start. Newly transplanted seedlings should be protected from wind and hot sun until they are growing well. Tin cans or "Hot Kaps" can be used for this purpose.

MOVE AS MUCH SOIL AS POSSIBLE WITH EACH PLANT.

SET PLANTS 1/2 TO 1 INCH DEEPER THAN THEY WERE BEFORE.

FIRM THE SOIL AROUND THE ROOTS AFTER TRANSPLANTING.

WATERING

Wise handling of garden soil to help it hold water is usually a better and cheaper plan than "watering". In most seasons, in Northern Alberta, there is enough rain, but it does not always come at the right time. Thus, there are methods of holding rain water in the soil where plants can get it.

Here are some methods of conserving moisture:

1. Keep a good supply of well-rotted manure or compost in the soil--this will hold water.

2. Keep down the weeds--don't let them get a start or they will steal the water that should go to your plants.

3. Thin out the plants that aren't needed--they will use water too.

4. Cover the soil around the plants with a mulch of straw or other material.

If you do these things, you'll find watering won't be necessary very often. Remember that a heavy watering now and then is better than many light waterings. The most common way to water the garden is with a hose and sprinkler.

When you water, do it thoroughly, making sure the soil is soaked to a depth of 4". Check depth with a trowel.

WEED CONTROL

A *weed* is a plant out of place. Volunteer vegetables not growing where you want them are weeds. They, like the weeds, compete with the other plants for moisture, nutrients, light, and air.

The weed control problem in most gardens can be made easier by following four simple rules:

1. Do a thorough job of soil preparation immediately before planting.

2. Cultivate between rows right after setting plants, or as soon as seeded crops come up. This kills a lot of small weeds before they are big enough to become well established.

3. Cultivate or stir soil to a depth of about an inch around plants and between rows at least once a week and as soon as the soil can be worked after each rain.

4. Never let weeds "go to seed" in or around a garden plot. This job requires attention later in the season after crop harvesting begins.

The best time to check weeds is when their seeds are sprouting. If, at sprouting time, the top inch or so of the soil is stirred very carefully so it dries out, weeds will be checked. Since weeds need plenty of moisture to get started, dried out soil will discourage them. Don't cultivate too deeply or cut off the roots of the plants you are growing. This will defeat the purpose.

GOOD TOOLS TO USE

You can use several tools for weeding the garden. Some like a straight-tooth rake best, others prefer a blade-type wheel hoe. If used in the right way it will work well and is easy to handle. An ordinary well-sharpened hoe can be used, although it is rather slow. All weeding--if it's to do any good--must be shallow, thorough, and timely.

Mulching the soil with straw, hay, lawn clippings, or black plastic holds down weeds. But be sure the mulch is weed-free and that every bit of soil is covered. Make sure, too that the mulch is close to the plant. Mulching the ground around tomato plants helps keep the fruit clean, checks loss from blossom-end rot, and conserves moisture.

A mulch is placed around transplanted vegetables when they are set in the garden or shortly after. Seeded crops may be mulched soon after they sprout.

COMMON CHICKWEED *(STELLARIA MEDIA)*

---COMMON CHICKWEED

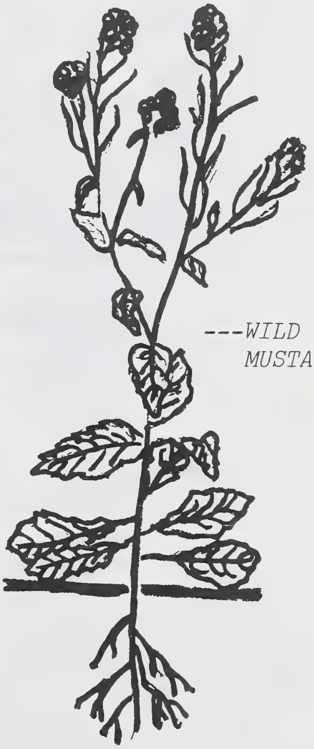
In spite of its frail appearance it is a very hardy and persistant weed. It is a low growing annual with a line of fine white hairs on the reclining trailing stems. Leaves are egg-shaped, ½ to 1 inch long located on short stalks. Flowers are white 1/4 inch across, the five petals easily mistaken for ten separate petals. The plant branches from a single, central root with fleshy, reddish stems.

HABITAT: Chickweed is common in gardens and lawns or wherever the soil is moist and rich.

WILD MUSTARD *(SINAPSIS ARVENSIS)*

This is an annual weed spread by seeds. It grows up to about three feet tall. Stems have stiff hairs at the base and leaves are, also, hairy on their undersides. Flowers are showy with four bright yellow petals. It begins flowering in June and continues throughout the summer.

HABITAT: Wild Mustard is common in grain fields throughout Alberta. It is worst on rich land.

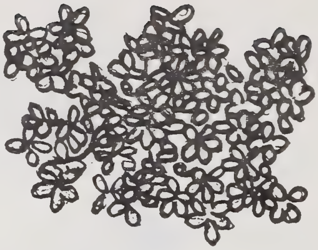


---WILD MUSTARD

PURSLANE *(PORTULACA OLERACEA)*

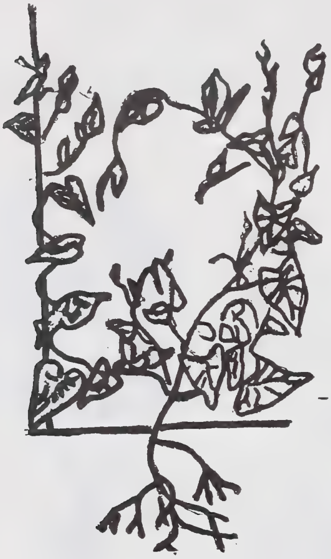
A succulent prostrate annual often forming mats up to 1½ feet across. Stems are reddish, thick, fleshy, and hairless. Leaves are shiny, dark green, thick, and ¼ - 1 inch long. Flowers are single, bright yellow, and ¼ inch across. Seeds are numerous, tiny, and produced in a pointed capsule, the top of which breaks off when mature.

HABITAT: Purslane (wild Portulaca) is a very troublesome weed in orchards and gardens. It cannot compete successfully with grain crops.



PURSLANE----

WILD BUCKWHEAT *(POLYGONUM CONVOLVULUS)*
(also known as black or climbing bindweed)



----*WILD BUCKWHEAT*

This is an annual spread by seeds. Stems are weak and trail along the ground or twine around other plants. Several stems grow from each plant. Leaves are arrow-shaped and pointed at the tip. Flowers are small and green or pink, without petals. Seeds are three-sided and dull black.

HABITAT: Wild Buckwheat is common in grain fields, gardens, and waste places throughout Alberta.

STINKWEED *(THLASPI ARVENSE)*
(frenchwood, penny cress)

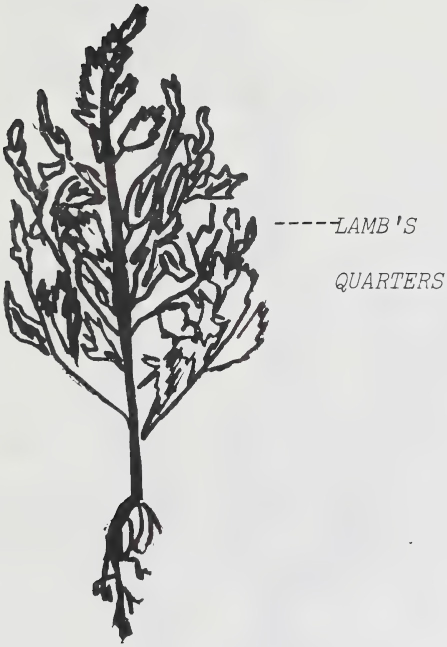
This weed is an annual or winter annual spread by seeds. It grows up to two feet tall. Flowers are white with four petals. They are in bloom from early spring to late autumn, depending on when the seeds germinated. The entire plant has a very unpleasant smell. When eaten by livestock, it taints the milk and meat.

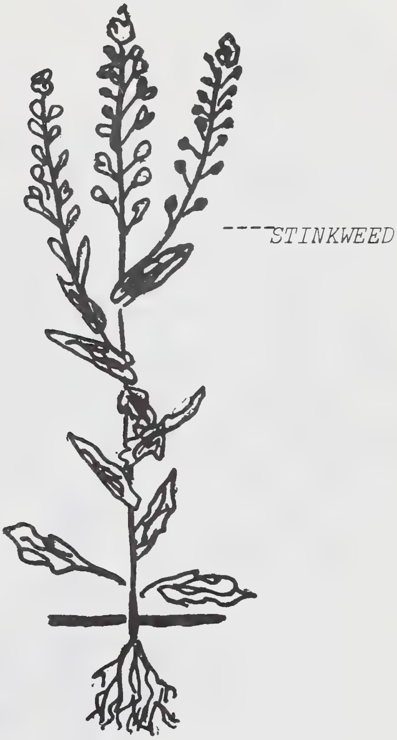
HABITAT: Stinkweed is common in fields and gardens throughout Alberta. It seldom persists in hay or pasture fields.

LAMB'S QUARTERS *(CHENOPODIUM ALBUM)*

This is an annual spread by seeds. It grows to three feet tall. Stems are ridged, sometimes with purplish stripes. Leaves are variable in size and shape. Their underside is greyish-green and covered with mealy particles. Flowers are small, green, and inconspicuous. Seeds are circular, flattened, and shiny black.

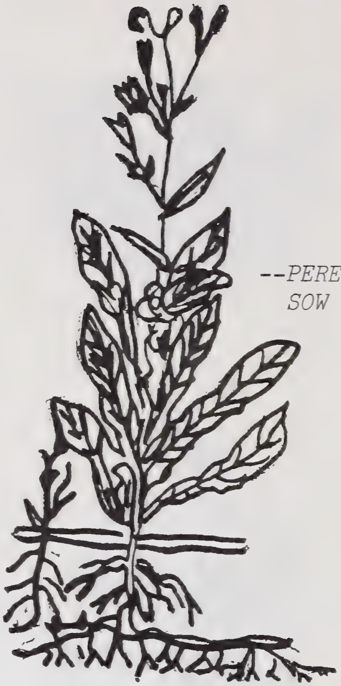
HABITAT: Lamb's quarters is chiefly a weed of gardens and rich soil.





PERENNIAL SOW THISTLE *(SONCHUS ARVENSIS)*

This weed is a seed spread perennial, which may, also, be spread by its fleshy creeping rootstalks. The plant grows erect from two to five feet in height and the hollow stem contains a milky sap. The leaves are alternate and six to twelve inches long, pointed, and deeply cut into uneven lobes. All leaf margins have small weak spines. The flowers are bright yellow in colour and are carried on leafless flower stems.



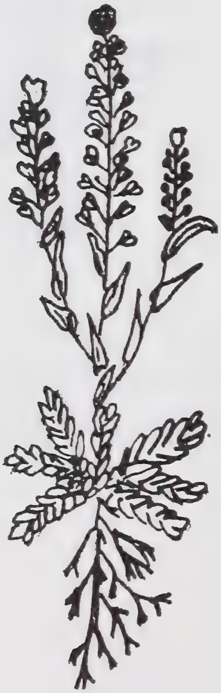
--*PERENNIAL SOW THISTLE*

HABITAT: Perennial Sow Thistle is a troublesome weed in the cultivated souls of the Dark Brown and Black Soil zones and along roadsides and uncultivated areas.

SHEPHERD'S PURSE *(CAPSELLA BURSA-PASTORIS)*

This weed is an annual or winter annual spread by seeds. Under good growing conditions it can grow two to three feet tall but it can, also, grow under very poor conditions, maturing seed at only 1 or 2 inches in height. Basal leaves are deeply cleft and clasp the stem. Flowers are small with four white petals. Flowering occurs from early spring to late fall. Seed pods are flattened and heart-shaped. This is, also the shape of purses carried by shepherds in former times.

HABITAT: Shepherd's Purse is found in grain fields, gardens, and waste places. It is less common in the drier parts of Alberta.

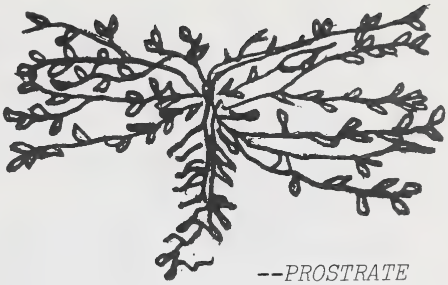


---*SHEPHERD'S PURSE*

PROSTRATE PIGWEED *(AMARANTHUS BLITOIDES)*

This is a low-growing plant in relation to the rest of the pigweed family.

HABITAT: This pigweed is native to the West. It is found chiefly in wayside places and waste ground. Prostrate pigweed is no problem in grain fields although sometimes troublesome in gardens.

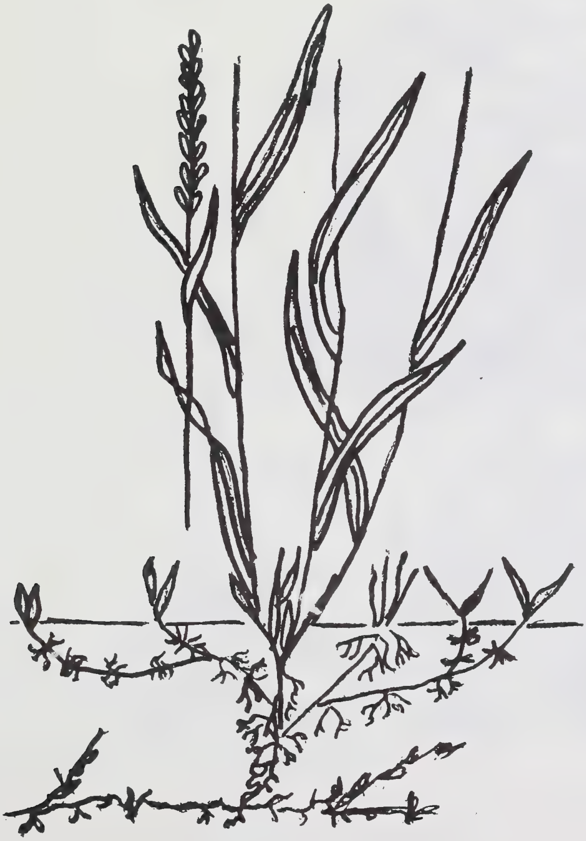


--PROSTRATE PIGWEED

COUCH GRASS *(AGROPYRON REPENS)*
(also known as Quack Grass)

This weed is a perennial plant which spreads by seeds as well as by rootstalks. The rootstalks are white or yellow in colour, cordlike, sharply pointed, and are partly covered with a leaf-like sheath. The plant grows up to 4 feet in height. The leaves are dark green in colour, distinctively ribbed, and slightly hairy on the inner surface. The leaves have small "hook-like" structures which clasp the stem at the bottom of the leaf blade.

HABITAT: Couch grass is common in grasslands, cultivated fields, gardens, roadsides, and waste places.

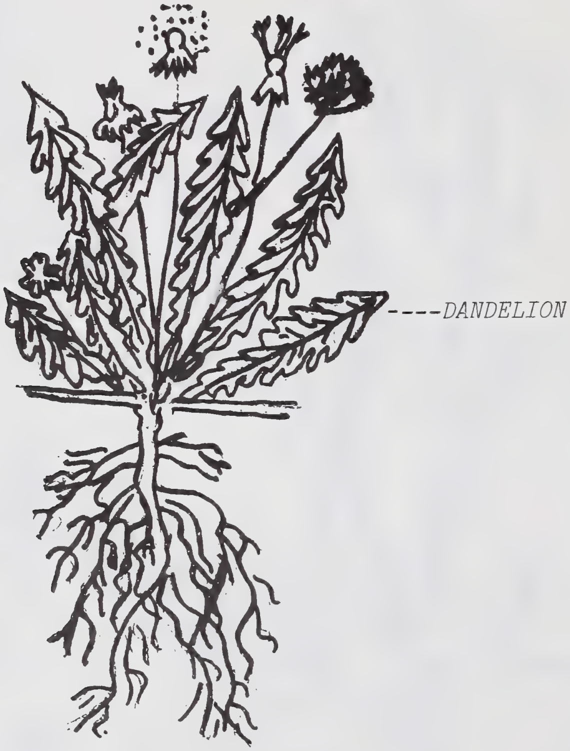


---COUCH GRASS

DANDELION *(TARAXACUM OFFICINALE)*

The dandelion is a perennial weed spread by seeds. It has no stem. The leaves contain a milky juice and grow in a rosette at ground level. Flowers are borne on hollow stalks which may be from less than 1 inch to 2 feet in length. Flower heads are 1 to 2 inches across and contain a cluster of bright yellow florets. Flowering starts in the early spring and continues throughout the summer. When ripe, the seeds are carried in the wind by a parachute of white hairs.

HABITAT: Dandelions thrive in moist spots throughout Alberta. They grow mainly in lawns, roadsides, and old stands of cultivated forage crops. They are not generally a problem in grain fields or wherever the soil is cultivated frequently.



HERBICIDE USE

Use of herbicides in the vegetable garden is not practical due to the variety of crops grown. However, they may be useful, before planting and after harvest to control quack grass.

DALAPON can be applied in the fall to growing quack grass at a rate of approximately five ounces per 1,000 square feet. Spring applications should be made at the rate of 2½ ounces per 1,000 square feet. Treated areas may be ploughed four to ten days later. Do not plant for four to five weeks after treating. Very good results have been found with fall applications of Dalapon.

INSECT CONTROL

Insect control in a garden should begin at planting time and continue throughout the season.

It's better to prevent insect damage in the garden than to let pests harm the produce. A clean-up of garden waste in fall or spring will help control some insect pests, but won't do the whole job. Insecticides should be used for treating the soil, treating some seeds (like corn), and for spraying or dusting plants.

New insecticides make prevention and control easier. However, many of these materials control only certain pests. Many have a long residual effect and should not be used on edible plant parts. Other insecticides are too poisonous to be recommended generally.

Treating the soil with chlordane or some other insecticides will control wireworms and white grubs. After the soil has been prepared for planting, sprinkle five to six ounces of *50% Chlordane wettable powder* evenly over a 1,000 square foot garden plot. Rake it into the upper two to three inches of the soil immediately. Then the garden can be planted.

This soil treatment may help to control root maggots in cabbage, radishes, turnips, and rutabagas.

PRECAUTIONS IN HANDLING INSECTICIDES

Insecticides are poisons developed to kill insects. Humans and animals can be accidently poisoned by swallowing the insecticide, by eating insecticide-contaminated food, or by prolonged exposure to dusts and sprays. Continued exposure to small quantities may not cause visible symptoms but some insecticides can accumulate in the fat and milk of man and animals.

If blurred vision, headache, tightness of chest or nausea are noticeable after exposure to insecticides, call a doctor at once or take the victim to a hospital immediately. Be sure what insecticide was used. Take the label of the container to the doctor, as the antidote is listed on it.

If medical or hospital attention is not immediately available, call the emergency numbers listed in your telephone directory.

In the event of any delay in obtaining professional advice, the following emergency treatments may be applied:

1. If the poison was swallowed, induce vomiting as quickly as possible. This can be done by giving one teaspoon of salt or ground mustard in a glass of warm water, or by sticking a finger down the throat.

2. If poisoning is by *BHC*, *Lindane*, *Chlordane*, *DDT*, *Dieldren*, *Endrin*, *Heptachlor*, or *Toxaphene*, give hot coffee or tea containing one ounce of epsom salts after the stomach has been emptied.

3. If the poison has been inhaled, move the patient into fresh air. If necessary, give artificial respiration.

The following should be adhered to whenever insecticides are used:

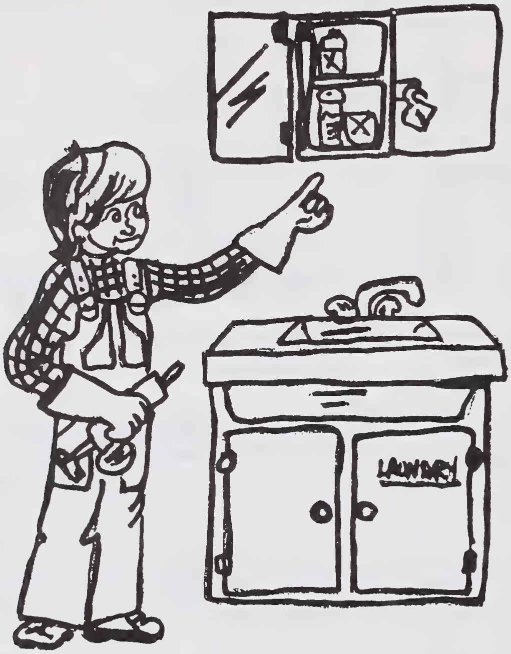
1. Read the label on the container. This may save your life and prevent accident. It will name the product and its most effective use. It will, also, tell how to handle the material and what should be done in case of accident.

2. Wear clean, undamaged protective clothing, e.g. coveralls and rubber gloves. Special care should be exercised with concentrates.

Respirators, with filter and cartridge, recommended for the specific insecticide, and goggles should be worn for volatile materials or extremely toxic dusts or sprays. With daily exposure (custom operators) complete coverage with waterproof clothing is necessary.

3. Change contaminated clothing as soon as possible and wash before re-use.

4. If insecticides are spilled on the skin, wash immediately and thoroughly with soap and water, as some are absorbed through the skin.



5. While spraying or dusting, prolonged exposure should be avoided, sprays and dusts should not be be inhaled, and smoking (especially handrolled cigarettes) should be avoided; all exposed parts of the body should be washed immediately afterwards.

6. Do not contaminate feed or water for livestock. Follow the rates of application shown on the labels, and strictly observe the cautions with regard to the use of treated crops.

7. Keep all pesticides in their original containers with proper labels. Keep them locked out of reach of small children, pets, or irresponsible persons.

8. Destroy all pesticide containers by burying them or burning them and avoid smoke from such fires.

9. Equipment should be checked with water for leaks, clogged nozzles, etc., before use. Breakdowns during operation may involve repair work to equipment containing highly toxic material. Equipment should be rinsed out and drained after use to prevent corrosion, rusting, or clogging.

CAUTIONS ON THE USE OF INSECTICIDES ON CROPS

Insecticides used carefully, in the right places, in the correct quantity, at the right time are an essential aid for gardeners. However, they are poisonous and users should be aware of some of the less obvious hazards associated with their use.

INSECTICIDE RESIDUE HAZARD

With any method of application some of the insecticide may drift out of the treated area and contaminate areas nearby. Do not allow drift to contaminate streams, sloughs, vegetable gardens, pastures, or any crop likely to be used for livestock feed. Avoid spraying in more than a light breeze or when turbulent air is rising from hot ground.

DON'T SPRAY ON A WINDY DAY!

Protect bees and other pollinators. Spray plants before they begin to bloom or when bees are not foraging. Warn beekeepers in advance if you intend to spray.

Insecticides should not be used indiscriminately, particularly on vegetables, because of the possibility of a toxic residue. Refer to the label before use.

DUST OR SPRAY THE GROWING PLANTS

The number of insect pests will vary from year to year. Watch for the first signs of trouble so you'll have time to prevent serious losses. As insect problems are discovered, check references on insecticides to discover the best method of control.

Usually gardeners like one dust or spray for everything. The safest insecticides to use on vegetable crops are probably those containing either *rotenone, pyrethrins, malathion,* or *methoxychlor.*

The methoxychlor-malathion mixture is effective against a wide range of insects including leafhoppers, flea beetles, potato beetles, cabbage worms, and thrips. For some special problems such as soil insects, European corn borers, corn earworms, and squash bugs, other materials may be used.

Rotenone and *pyrethrum* are, also, useful insecticides for crops nearing harvest. Use rotenone as a 3/4% or 1% dust or as a spray containing 4 tablespoons full of a 4% wettable powder per gallon of water. Pyrethrum is usually available as a 0.2% dust. Spray concentrates vary in concentration so follow the manufacturer's directions.

Malathion is effective against most aphids and red spider mites. Use two teaspoons full of 50% malathion emulsifiable concentrate per gallon of water or 2 tablespoons full of 25% malathion wettable powder per gallon of water.

After potato plants are three to four inches tall, they should be dusted or sprayed every seven to ten days. All gardeners should have a potato spray or dust containing mixtures of *toxaphene.*

PLANT DISEASES

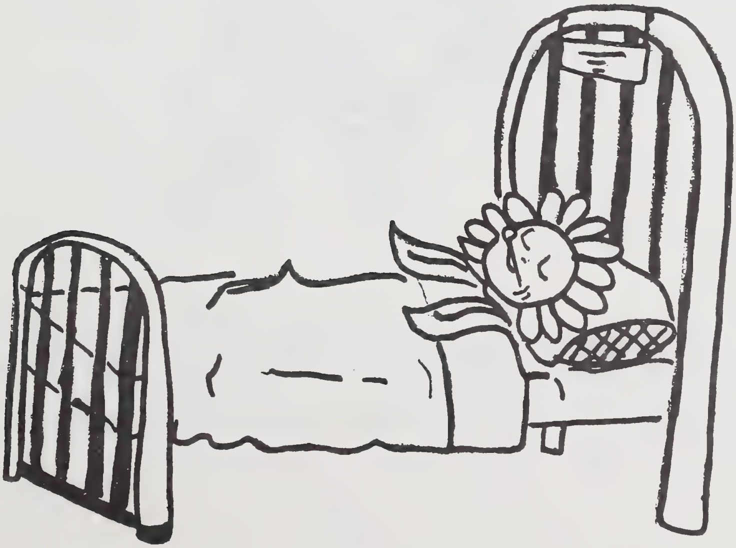
Many diseases will not appear if proper care is taken in advance. 4-H gardeners will want to have clean seeds, healthy plants, and clean soil.

Buy seeds from reliable dealers and grow plants carefully in clean soil or buy plants from trusted growers. All diseased garden refuse, such as plant stalks and roots, should be burned. If healthy, it can be put in the compost pile or plowed under.

Anthracnose and bacterial blight on beans; black rot and yellows on cabbage; and blight on celery trace back to diseased soil or diseased seeds, plants, and plant refuse.

Before sowing seed it is desirable to treat the seed with a fungicide such as *thiram*, *captan*, or *dyclone*. Follow directions on the container. Usually all you need is a toothpickful in the average seed packet. Shake the packet so the seeds are coated. This inexpensive treatment will help check such seedling diseases as damping-off, and will help produce more uniform stands of plants.

When you first see signs of plant disease, it is often too late to save the affected plants. Thus, you should know something about diseases that are likely to strike and how to take preventative measures. Some of these measures are a selection of disease-free seed, soil, and plants; use of resistant varieties; seed treatment with chemicals or hot water; and destruction of insect or seed carriers of diseases. A good insect control program will help to prevent disease problems in the garden.



Sometimes if diseases are detected early enough, their spread to other plants or other parts of the same plant can be prevented or delayed by using fungicide. *Zineb* and *maneb* show promise in controlling early and late blight on potatoes, tomatoes, and celery.

Some seasons powdery mildew will attack the foliage of vegetables like melons, cucumbers, peas, pumpkins, and squash. The leaves become covered with a greyish powder and extensive drying and killing of foliage can result. *Karathane* is a new fungicide that gives good control of mildew.

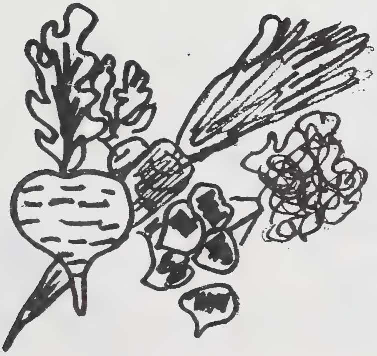
Remember that there is no magic in fungicides. They protect only the plant parts they cover. They wash off more or less when it rains. Consequently, frequent and thorough application is essential.

Many diseases as well as insects invade the garden from weeds which surround it. Spraying weeds with herbicides and insecticides will help greatly to control garden pests. Don't cultivate or harvest vegetables when plants are wet or you may spread disease, especially in beans.

Slugs and small snail-like creatures feed on stems, leaves, and fruits of many vegetables. They may be killed with baits containing fresh metaldehyde, or trapped under boards.

ROOT CROPS

Beets, Carrots, Parsnips, Radishes, Summer Turnips, and Rutabagas.



Seeds of all these crops are planted directly into the garden. Since beets and summer turnips usually become woody if over ripened, two plants are recommended. One sowing should be as early as possible and the other around June 15. The first radishes should be sown as early as possible, more planted again 10 days later, and again 10 days after that (3 plantings). Rutabagas are planted around June 1, but parsnips, because they grow slowly, should be sown as early as possible. Two sowings of carrots are generally made. The seed is planted as early as possible in the spring for summer use. More may be planted at the end of May or early in June for winter storage.

The seed is sown about three quarters of an inch deep, although beets may be planted a little deeper. The seedlings will have to be thinned so the growing roots are not crowded. Radishes and early carrots should be thinned to one inch apart and later carrots should be thinned to 2 inches apart. Three to four inches are required for beets, parsnips, and summer turnips; and 6 to 8 inches for rutabagas. If garden soil is very dry, it may be necessary to leave more room between the seedlings.

LEAFY VEGETABLES

Spinach, New Zealand Spinach, and Swiss Chard.

Spinach must be grown early in the season, as long days and hot weather cause it to form seed heads. New Zealand spinach is not a true spinach but is most useful as it grows well in hot, dry weather. Swiss chard withstands heat well and produces a continuing supply of greens all season long. Spinach and Swiss chard should be thinned to at least 6 to 8 inches in the row and New Zealand spinach from one to two feet.

Lettuce and Cress.

Lettuce is one of the most popular salad vegetables grown. Cress is not so commonly grown but is valuable as a flavouring for salads and salad decoration.

Cress is seeded directly into the garden. The first seeding is early in the spring and more seed is planted in about three weeks. Cress plants soon reach the flowering state and become unuseable.

There are three types of lettuce grown--*leaf, head,* and *Cos*; the first 2 being the most comming in this province. There are, also, two types of head lettuce:

1. Butter Head, with soft textured leaves and golden yellow inner leaves,

2. Crisp Head, with coarse textured, brittle leaves, and a white heart.

Head lettuce may be started indoors about April 1 and transplanted outdoors late in May similar to cabbage, or it may be seeded outdoors as early as possible in the spring. Leaf lettuce is seeded directly in the garden in early spring and again two or three weeks later. Cos lettuce is treated similarly to head lettuce.

Seed sown directly into the garden should be one-half to three-quarters of an inch deep. Plants should be thinned to stand at least 2 to 3 inches apart for leaf lettuce and 8 to 10 inches for head and Cos types.

SEED AND FRUIT VEGETABLES

Vine Vegetables: Cucumbers, Pumpkin, Squash, Vegetable Marrow.

Seed and Fruit: Peas, Beans, Corn.

1. Vine Vegetables: Seeds of this entire group are generally planted in the garden about May 25 at a depth of about one inch.

Cucumber, muskmelon, and watermelon are often grown in rows 5 or 6 feet apart and the plants thinned to one foot in the rows. The other three members of this group are usually grown in hills at five or six feet spacings. For the hill system, 8 to 10 seeds are planted over an area about one foot in diameter and 5 or 6 of the strongest plants are left after thinning.

The waxed-paper type of plant protectors (Hotkaps, Hotents, etc.) generally result in earlier, and often heavier yields of vine crops. They may be used over the plants started from seed in the open garden or over transplants. They protect the plants from chilling and, also, from light frosts. A two inch triangle for ventilation should be cut in these structures on the side away from the winds. The flap should be merely bent down so that it can be closed if cold weather threatens. These protectors should not be quickly removed or the violent change in environment will set the plants back severely. Rather, when the developing plants have nearly filled the structures, a sharp knife should be used to cut two-six inch slits in the tops, at right angles to each other. The growing plants are allowed to force their way through this opening before the paper structure is torn and carefully removed.

A mulch of clear, polyethylene plastic have given excellent results with this class of vegetable. Yields are almost invariably earlier and heavier. Widths up to three feet are used, depending on row spacing and it is so arranged that the row of plants is situated in the middle of the strip. Earth must be banked along both sides and ends to prevent the wind from blowing the sheeting away. Before the plastic is laid, the soil should be raked so that the centre of this strip will be an inch or two lower than the rest. This will serve to direct water from rains to the plant roots. Small openings are cut in the plastic where the seeds are to be planted or the transplants are to be set. This plastic should be left in place all summer. If frost threatens the young plants, they may be covered with Hotkaps or Hotents.

i) *Pollination:* Often there are insufficient insects available or the weather is too cool for them to transfer pollen from the male flowers to the female flowers. In this situation the young fruits turn yellow and shrivel, instead of developing properly. Both male flowers and female flowers are produced on the same plant. A young, underdeveloped fruit is situated at the base of each female flower while the male flower has no such fruit. *Hand pollination* consists of transferring some of the yellow dust-like pollen from the male to the female flowers. This may be done with a small, soft brush or by removing the petals from the male flower and wiping some of the pollen on the stigma of the female flower. A few minutes thus spent may often mean the difference between a good, early fruit set and almost nothing at all.

2. Seed and Fruit:

i) Beans: Several types of beans are grown, the most important being Common or Kidney, Broad, and Scarlet Runner.

The common bean has three classes: *snap* or *string*, *green-shelled*, and *dry-shelled*. The snap bean, which is grown for its edible pod, is by far the most important in this province and is represented by two types of plants - "Bush and Pole". Pole beans require support and usually bear later than the bush types. Both green-podded and yellow or wax-podded varieties are found within each plant type.

Broad beans are grown for the large seeds which are used in the green condition. The scarlet runner bean is used as an ornamental climber as well as a source of food. The pods are used as string beans when immature and the seeds are sometimes used as a substitute for lima beans.

Snap beans and Scarlet Runners are warm-season crops and should not be sown until May 15-25, depending upon location and weather conditions. They should be sown so that plants will stand from 3 to 4 inches apart in the row and seed should be covered by an inch and a half or so of soil. A second sowing of snap beans may be made 10 days to 2 weeks after the first. Support should be provided for pole beans as soon as climbing tendencies are known.

The Broad Bean is classed as a cool-season crop and the seeds may be sown considerably earlier than those of the common bean. Seeding may usually take place shortly after May 1 and seeds should be sown 3 to 4 inches apart and at a depth of 2 inches. The plants should be thinned to stand 4 to 6 inches apart in the row. It is good practice to pinch off the top of each plant after five or six pods have set on each.

ii) Corn: Both sweet corn and popcorn can be successfully produced regularly in practically all regions of this province. A number of suitable sweet corn varieties are now available.

Corn may be grown either in continuous rows or in hills. With the continuous row, the aim is to have a plant every 9 to 12 inches, and with the hill system a distance of 3 to 4 feet should be maintained between hills with about 4 to 5 plants per hill. The seed is sown directly in the garden at a depth of one and one-half to two inches between May 15 and 30, depending upon the locality. Seeds should be sown about twice as thickly as the intended thickness.

It is worth taking a chance with an earlier sowing. If the first plants escape frost, an earlier harvest of corn will be obtained and if they are killed, the normal planting is still available. The plants should be thinned while they are quite small. The removal of suckers or tillers is not recommended.

Where both popcorn and sweet corn are to be grown, the two types should be separated by at least 200 yards. This is necessary in order to help avoid *cross-pollination*, which is detrimental to both types. Corn is wind pollinated, and therefore a planting should be in the form of a block rather than rows.

iii) Peas: Two classes of peas are grown in the garden. These are the common garden pea in which the seeds are used only and the edible podded pea in which the whole pod may be eaten.

Peas can be sown as soon as the soil is ready for gardening in the spring. Successive plantings should be made in order for fresh peas to be available over a prolonged period. About three plantings of one variety may be used at two-week intervals or early, main crop and late varieties may be used to obtain the same results. Depth of seeding should be from 1 to 1½ inches and plants should stand from 2 to 4 inches apart in the row.

Peas should be harvested before the pods are tightly filled and they should be used very shortly thereafter. If they must be kept in the fresh condition for any period of time, they should be held at a temperature only slightly above freezing, preferably in the pod.

BULB CROPS

The only important bulb crop in Alberta is *Onions*. Onions are grown in practically every garden.

Onions may be grown from seed sown directly outdoors, from transplants which have been planted indoors, or from *"sets"*. Transplants will almost invariably result in a heavier crop of high quality bulbs than would be obtained from seeding directly outdoors.

For transplants, the seed should be sown indoors in early March. When the tops grow beyond a height of 4 to 5 inches, they should be clipped back to about 4 inches. These plants may be set in the open garden in late May, with spacing in the rows usually being 4 inches.

Seeds to be sown outdoors should be planted as soon as the soil is dry enough to work in the spring, at a depth of one-half to three-quarters of an inch. Plants should be eventually thinned to stand 3 to 4 inches in the rows.

Pickling onions are grown from seed, but should be sown rather thickly and no thinning practiced.

Dutch sets should be planted early in the spring at about four inches apart in the rows.

Onions should be grown at such a depth that most of the bulb will be above the soil. If necessary, some soil may be carefully raked back in order to achieve this.

HARVESTING AND STORAGE

WHEN TO HARVEST

To get the most out of a garden, harvest your vegetables at the proper stage of maturity. Most vegetables reach their highest quality and are used when in the young or immature state. We may freeze or can vegetables as soon as they reach the proper state. Others are used fresh from the garden.

HOW TO STORE

Many garden vegetables that are not canned or frozen may be stored. With proper storage you can assure yourself a supply of fresh vegetables during the winter

For successful storage, however, you must have well-matured, good quality vegetables. The storage room must have proper moisture and temperature conditions. Frequent sortings and removal of decayed vegetables will help preserve your supply.

Harvested vegetables are not dead but still are living organisms. They continue to grow in storage. If growth is rapid, the food stored in the vegetable will soon be used and the quality will disappear. The vegetable will break down and rot. Proper control of temperature and moisture will retard growth and prolong the storage life of the vegetable.

Not all vegetables require the same conditions for successful storage. They can be separated into the following three groups:

Warm-Dry - for squash and pumpkins,

Cool-Dry - for onions, dry peas, and beans,

Cool-Moist - for root crops, potatoes, cabbage, and apples.

Warm-Dry Storage

Furnace rooms or upstairs storage rooms are usually warm and dry. Humidity ranges from 50-70% and temperatures are between 50 and 60 degrees F.

Before placing pumpkins and squash in storage, be sure they are fully matured and cured. Keep them in a heated well-ventilated room at 75-85 degrees F. for about two weeks following harvest to harden the shell. If the weather is warm, this can be done by leaving them in small piles in the field. Cover the piles if it looks like frost. Avoid bruising or scratching the skin.

Cool-Dry Storage

Unheated storage rooms such as attics or closets are suitable for storing dry beans and peas. Onions can be stored in similar places if the temperature does not get below freezing.

Harvest beans after the pods are mature. Spread them out, dry, and shell. Place in bags, cans, or jars, and store at 25-32 degrees F. and 70-75% humidity.

Popcorn should be thoroughly mature when placed in storage. It is best stored at 25-32 degrees F. It may be stored shelled in airtight containers or on the cob. If too dry to pop well, add a tablespoon of water to one quart of corn an hour or two before popping.

Onions should be thoroughly mature. To hasten maturity roll down tops in late August. When fully mature, they have a narrow neck. Remove tops, place onions in shallow boxes or trays with ventilated bottoms, and cure outdoors or in a airy shed or room for 3 to 4 weeks. Place in storage at 32-36 degrees F. and 70-75% humidity. Onions may be stored in mesh bags hung from the ceiling of the vegetable storage room.

Cool-Moist Storage

Most homes do not have cool-moist places for vegetable storage. Basements are usually too dry or warm unless there is a special cool, dark, ventilated room that is insulated from frost on the outside and the heat of the furnace inside. Such a room may be built in the basement by insulating walls and ceiling and ventilating through a cellar window.

Carrots and beets store very well in ten-gallon crocks or any container that will prevent excessive shrivelling. Low storage temperatures between 32 and 40 degrees F. apparently are the key to successful carrot and beet storage.

Containers should be covered with a burlap sack or piece of cloth to keep the air moist. If carrots are stored at higher temperatures, completely remove the carrot crown and store carrots in damp sand. Do not trim beets too closely. They will bleed unless at least one-half inch of the top is left.

Rutabagas, turnips, and parsnips may be waxed and stored at temperatures between 32 and 40 degrees F. If not waxed, they should be placed in containers or buried in sand to prevent shrivelling. Parsnips may be left in the garden all winter and used the following spring.

Potatoes should be free from dirt and disease. Destroy all blighted tubers. Seed potatoes may be stored as low as 32 degrees F. but should not be allowed to freeze. Table stock potatoes should be stored above 36 degrees F. to prevent sweetness. If they do become sweet because of exposure to lower temperatures, their natural flavour may be restored by holding them at room temperature for a few days.

The tomato season can often be extended by picking fruits at the pink stage or at the green-mature stage (when they turn from green to light green or white). At 40 to 50 degrees F., pink-stage tomatoes can be kept seven to ten days, while green mature tomatoes may be kept one to six weeks. Ripening increases with higher temperatures. Just before frost kills the vines, they can be pulled and hung in the garage or basement with fruits still attached. Fruit will continue to ripen.

Parsley and chives may be taken out of the garden in the fall, potted, and grown as house plants. It is important to take a considerable part of the root system with soil surrounding it. Remove several of the outer leaves of parsley to reduce water loss following transplanting. In addition to beautifying the kitchen, these plants will supply leaves for flavouring and garnishing dishes during winter months.

SALAD PLATES AND RELISH TRAYS

Salad plates and relish trays are good ways of using the vegetables you grow.

SALAD PLATES

A salad plate is a cold main dish made up of salad materials. Because it is a main dish it must include an additional protein food such as cold meat, hard cooked eggs, or cheese.

Keep the following points in mind:

1. A salad plate is a meal to be served on an individual plate. It, therefore, must include enough food to satisfy the individual.

2. Along with a breadstuff, beverage, and dessert, the salad plate must meet the nutritional requirements for a complete meal.

3. It must include a variety in flavour, texture, colour, and shape so as to be appealing and tasty.

The same basic principles may be applied to both vegetable and fruit salad plates.

Examples of food suitable for vegetable salad plates:

1. Potato salad; macaroni salad; fresh spinach salad; fresh celery and apple salad; green beans; bacon and cheese salad; cole slaw; tossed vegetable salad with ham and chicken.

2. Stuffed eggs, cheese cubes, meat strips.

3. Sliced tomatoes, cucumbers, carrot curls, radish roses, turnip sticks, pickles.

RELISH TRAYS

A relish tray is a plate of finer foods to be passed at the table which adds colour, texture, and flavour contrast to a meal. It is an attractive arrangement of raw vegetables such as celery, carrots, turnips, radishes, and cucumbers. Mushrooms, cheese cubes, pickles, and other finger foods are often added for variety. Combinations such as stuffed celery are, also, acceptable.

Keep the following in mind:

1. All foods on a relish tray must be easily eaten with the fingers.

2. Arrangement should be attractive and neat.

3. There should be a good balance of variety in kinds and number of foods, colour, shape, texture, and flavour.

4. The plate used is ordinarily larger than a regular dinner plate.

PRESERVATION BY FREEZING

The family that has a home freezer should be able to depend entirely upon their garden for an abundant supply of vegetables the year round. Foods properly stored by the *quick freeze method* are safe and they retain more food value and more of their natural flavour and colour than those preserved by other methods.

PREPARING FOODS FOR QUICK FREEZING

1. Freezer space is limited and should be saved for essential foods high in health building qualities which are not just as good preserved by other methods.

2. Not all varieties of vegetables are suitable for freezing. Consult the bulletin *Preserve By Freezing* (which is available from your local District Home Economist) to learn what vegetables and what varieties to freeze.

3. Select only fresh, prime quality foods. Do not use bruised or injured fruits and vegetables.

4. Wash foods thoroughly before freezing.

5. Blanching is very important for vegetables to be frozen. Without blanching chemical changes may take place which alter the colour and flavour of the product. Follow instructions for blanching given in your bulletin *Preserve By Freezing*.

6. Freeze quickly after picking. Try to get foods to the freezer as quickly as possible after packing.

7. Do not pack cartons too firmly or too full. You may crush the fruit or vegetables. Also, remember that many foods expand when frozen. If packed too tightly, the carton may burst. Follow instructions for headspace given in the freezing bulletin.

CONTAINERS FOR FREEZING

Use only the types of containers and wrapping materials advised in the freezing bulletin. It is most important that they be both water and airtight. Canned foods must be airtight to keep spoilage organisms in the air from entering. Frozen foods must be airtight to keep the moisture in the foods from getting out. Glass sealers may be used but they are not recommended. Plastic freezer bags which are available in several sizes are suitable for most vegetables.

OTHER METHODS OF PRESERVATION

Vegetables may be preserved by other methods than freezing or storing. They may be canned, salted, pickled, or dried. Some vegetables such as beets and carrots are used in jelly or jam. Experiment with different methods of preserving your vegetables.

Try different methods of serving your vegetables both fresh and cooked.

EXHIBITING VEGETABLES

A good vegetable display should:

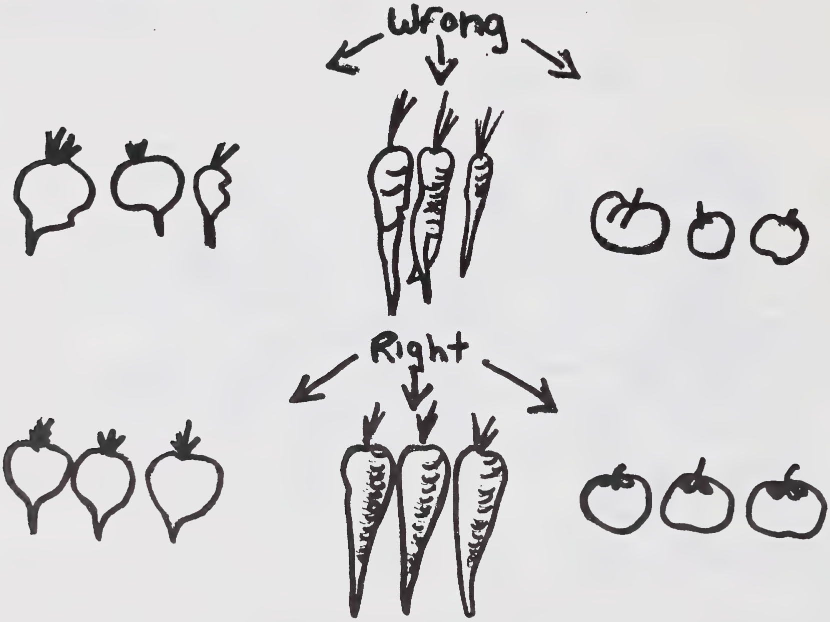
1. Show that better produce is the result of the use of good seed of adapted varieties.

2. Show what can be produced with the use of improved cultural methods and control of insects and disease.

3. Show different kinds of vegetables and varieties.

4. Show balanced selection of vegetables for their nutritive value.

5. Show effects of good showmanship: vegetables grown and prepared for attractiveness.



SELECTING AND PREPARING VEGETABLES

When selecting and preparing vegetables for your Achievement Day or for some other show, keep in mind the fact that quality is very important. Select the very best of each kind of vegetable for show purposes. Some vegetables, such as carrots and beets wilt rather quickly. Exhibits should be selected only a short while before show time, and stored in a cool room until show time. This will help keep the vegetables fresh.

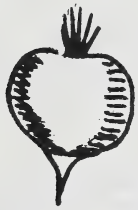
The largest vegetables do not always have the best quality. When vegetables are extra large, they usually are coarse and tough. In general, select vegetables which are of average or slightly above average size for show purposes. The specimens that make up the exhibit should be clean and uniform in size, shape, and color. They should, also, be free from insect and mechanical damage, bruises, or cuts.

EXHIBIT REQUIREMENTS

The number in the brackets below after each vegetable indicate the number of specimens required to make up an exhibit. It is the number usually required for horticultural shows.

1. Beans, Snap or String (12)--Pods of good length, uniform in size, shape, and color; clean and free from disease or blemishes; also crisp, fresh, and free from stringiness. The seed should not be fully developed. Specimens should be wiped clean, not washed.

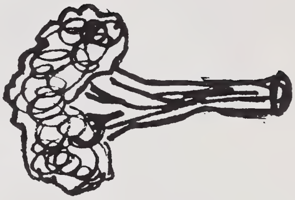
When necessary, dried beans may be shown. A half pint of dried beans makes an exhibit. The seeds should be uniform in size and color.



2. Beets (5)--Not over three inches in diameter; color-dark red inside and out (free from light colored rings); free from side roots; crown small and free from splits, scaling, and sunburn; tops removed about 1½ inches from the crown. Beets should be clean, side roots removed but not tap roots.

3. Carrots (5)--Medium in size, smooth, and straight; free from side roots, injury, and sunburn (shown by green color). Carrots selected should have a small crown, an indication of a small core. Carrots shown clean and free of dirt; tops should be removed one-half to one inch from the crown.

4. Broccoli (2)--Although the heads quickly wilt, broccoli is sometimes exhibited. Heads should be dark green and compact. Avoid any yellow flowers in the head. Stems should be cut about 5 inches from the top of the head. Specimens should be free from insects or defects.



5. Cabbage (2)--Select firm, compact heads that are not soft or withered. Stems should be cut about ½ inch below the head. Remove all blemished or broken leaves but take care not to peel the heads too much. A few outside wrapper leaves are desirable. Specimens may be washed.

CABBAGE

CAULIFLOWER

CELERY

CORN

6. Cauliflower (2)--Select white, compact heads that are free of small leaves and ricey texture. Cut stems so as to leave four to six leaves. Trim these outer leaves 1 to 2 inches above the white head. Use a soft bristled brush to remove dirt from the heads. The curds of the head turn brown quickly if damaged.

7. Celery (2)--Remove roots of the stalk and trim the butt to form a triangle or pyramid. Trim off diseased and broken leaves on the outside until the colour is uniform. Avoid pithy, woody, and stringy stalks.

8. Corn, sweet (3)--Shown in fresh, edible condition, ears uniform in size and evenly filled from tip to base with straight rows of well-developed kernels. About one-third of the husk is removed from the tip to the base of the ear.

9. Cucumbers--Slicing (2)--Uniform in size, shape, and colour. (Usually dark green), free from blemishes, fresh firm seeds not well-developed; length 6 inches or longer. Overripe fruit is usually a duller green.

--Pickling (6)--Uniform in size, shape, and colour, dark green; length usually two to three inches.

10. Eggplant (2)--Select fruits of uniform purple colour that are free from bronzing and greening. Leave stems on the fruits and wipe the fruits clean but do not wash them. Avoid large or wilted fruits. Dark spots indicate bruises or decay.

11. Kohlrabi (3)-- Remove roots just below the ball. Remove all but the upper 4 to 6 leaves. Select specimens that are uniform, medium size, and not hard or woody. Wipe clean but do not wash. Skin should be easily punctured by thumbnail.

12. Head Lettuce (3)--Large, firm heads; leaves tender; crisp, and free from discolorations. The outer damaged leaves, also, roots and stems are removed.

13. Leaf Lettuce (3)--Crisp, tender, uniformly green in colour. The outer leaves, the stem, and roots should be removed. Free from blemishes.

14. Muskmelons (2)--Harvest fruits when they separate easily from the vines. Specimens should be free of soft spots, mechanical injuries, and discoloration. Wipe clean but do not wash.

15. Onions (5)--Have specimens mature and thoroughly cured. The neck should be small. Do not peel to give a slick appearance. Remove only such outer scales as are broken or discolored. Small basal roots should be left intact but trimmed to a uniform length of ½ inch. Wipe or brush but do not wash.

--Pickling or bunching (12)

16. Parsnips (5)--Uniform in size and shape; straight and uniformly tapered of good length; smooth and free from side roots, blemishes, and insect injury. The crown should be broad, about 3 inches in diameter, core small. The tops removed ½ inch from the crown.

ONION

PARSNIP

17. Peas (12)--Good sized pods, uniform in size, and shape, fresh and free from diseases or blemishes. The pods should be filled with well-developed, tender, sweet-flavoured peas of good green colour. Overripe pods should be avoided.

When necessary, dried peas may be shown. A half-pint of dried peas makes an exhibit. The peas should be clean, uniform in size, and colour; free of leaves or other material.

18. Peppers (5)--Select specimens that are uniform in size, shape, and colour, and free of disease or other defects. Leave stems ½ to 1 inch long. Wipe fruits clean but do not wash.

PEPPER

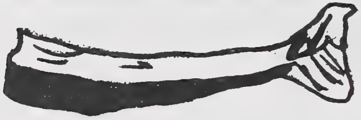
POTATO

PUMPKIN

19. Potatoes (5)--Shape and colour uniform and typical of the variety. They should be smooth, firm, and with few and shallow eyes; medium size is preferred. Tubers should be free from bruises, diseases, blemishes, insect damage, and sunburn (green colour). The tubers should be free from dirt.

20. Pumpkin (2)--Medium or slightly above medium in size, shape, and colour; symmetrical, clearly ribbed, heavy, free from blemishes; usually reddish orange in colour; stem attached.

21. Rhubarb (5)--Select specimens that are straight, uniform and unblemished. Stalks should be pulled from the plant, not cut. Trim the leaf blade to about 1 inch above the stalk.



22. Summer Squash (2)--Select small to medium size fruits when the rind is soft and easily punctured with thumbnail. Select specimens that are uniform in size, shape, and colour. Leave about ½ inch of stem and wipe fruits clean.

23. Winter Squash (2)--Medium or above medium in size, uniform in size, shape, and colour; heavy, symmetrical, firm, and free from

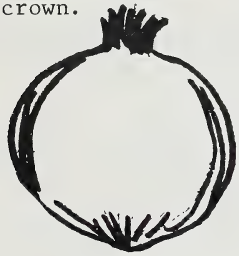
blemishes, colour, and shape typical of the variety, stem is attached, mature-rind resists pressure of the thumbnail.

24. Swiss Chard--Select plants that are fresh, crisp, and have bright green leaves. Trim off roots and trim butts to a pyramid shape. Exhibit like celery.

25. Tomatoes (5)--Select fruits that are uniform in size, shape, and colour. Remove stems. Fruits should be perfectly shaped and free of cracks or blemishes.

(12)--Pickling or preserving.

26. Turnips, Swede (3)--Medium size, about five inches in diameter, clean, smooth and firm, free from side roots, insect damage, and blemishes. The flesh should be tender and the tops trimmed to about ½ inch from the crown.



TURNIP, SWEDE

WATERMELON

27. Watermelons (2)--Fruits should be mature but not overripe. Leave one inch of stem on each melon. Wipe but do not wash.

28. Vegetable Marrow (2)--Uniform in size, shape and colour, of medium size (16 - 20 inches long); smooth, firm, symmetrical, free from blemishes; straight and slightly ribbed with stem attached.

29. Vegetable Collections--Vegetable collections usually consist of 5 or more different kinds. The quality, variety, and suitability of the vegetables in the collection are important. The neatness, arrangement, and attractiveness of the collection are, also, considered. A strong cardboard or wood box, that is about 4 inches deep, makes a good container to use in exhibiting the collection.

For show purposes, root vegetables such as *carrots*, *parsnips*, *beets*, *radishes*, and *turnips* should be washed free of dirt. *Leaf lettuce* and *head lettuce* may, also, be washed. *Potatoes* for exhibition should not be washed, but cleaned with a soft brush. (NOTE: root vegetables and other vegetables intended for winter storage should not be washed.)

POINTERS ON JUDGING VEGETABLES

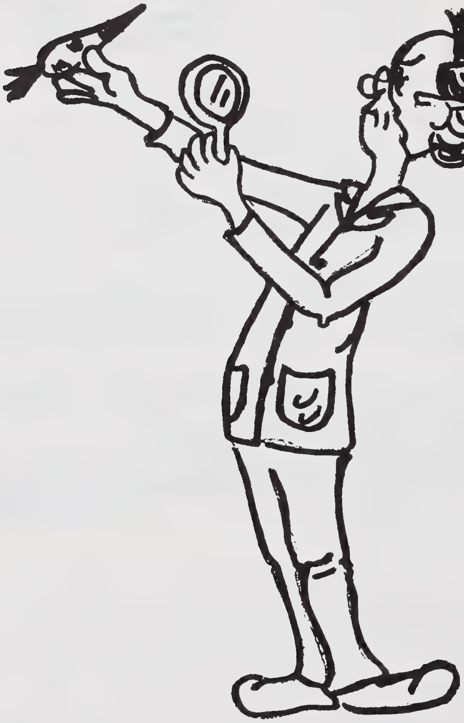
1. Be sure to know the class you are judging.....e.g. table potatoes or seed potatoes.

2. Be sure that you know how the samples in the class are identified....e. g. plate A, plate B., plate C., and plate D.

3. Approximately one-half of the time allotted for judging a class of vegetables should be spent on looking over the samples and the other half devoted to writing reasons for placings.

4. Look over all vegetables in each sample carefully for smoothness, uniformity, freedom from bruising, disease and insect damage.

5. For some judging classes, one of the vegetables in each sample will be cut....e.g. one carrot, tomato, etc.



SUGGESTIONS ON WRITING COMMENTS

1. Have a good pencil with an eraser on it. It is best not to write in ink in case you want to make changes.

2. Be sure you put your name, club, and the class you are judging on your judging card.

3. Write clearly and concisely. Do not scribble or crowd words.

4. Learn judging phrases and terms that apply to each particular class of vegetable.

5. Evaluate the samples or plates of vegetables in the class; do not compare one exhibit against another when making comments. For example, samples in exhibit B are uniform in size and shape. The core of the carrots are firm and of good colour. The exhibitor could have taken more care in cleaning the samples

6. Comments do not need to be lengthy, however, they should cover the important points for making a placing.

7. Adjectives such as "good", "better", and "best" should not be used in writing comments.

8. Organize your comments concerning the exhibits, so that the important characteristics receive the most emphasis.

9. Give credit for the strong points a sample may possess even though it is not placed in the top portion of the class.

JUDGING CERTAIN VEGETABLES

When certain vegetables are being judged, it is necessary to cut them in order to check the quality, colour, or firmness of flesh or, in some cases, the size of the core. Beets, carrots, parsnips, slicing cucumbers, potatoes, and tomatoes should be cut in cross-sections. Swede turnips or rutabagas may be examined by cutting out a small section of core from the middle.

NOTE: Refer to the publication *"Judging Standards For Horticulture Shows"*, (Agdex 200-47) available from your Department of Agriculture, Extensions Office OR write to the Publications Office, Room 803, Agriculture Building, Edmonton, Alberta.

GARDEN RECORDS

INTRODUCTION

Keeping a record of your work is an important part of your project.

A good record book can be a valuable reference for future projects.

Here are a few hints that will help you complete a good record book:

1. Do all your figuring and calculation on a scratch paper first, then transfer your work to your record book.

2. Always use ink and try to avoid erasing and smudging.

3. Start your records as soon as you enroll in the club. Work on it throughout the year and keep your records up to date. When you finish your project year, you will only have a few final records to add.

Pages 64 - 68 of this record book are to be completed by all members, in all sections. Use these sheets as guides in making your own record book in an individual folder.

MEMBER'S NAME ______________________________

ADDRESS ______________________________

NAME OF CLUB ______________________________

CLUB LEADER ______________________________

PROJECT SECTION ______________________________

GARDEN PLAN

BEFORE you plant your garden, make a map of your plot. Show the shape, size, number of rows, and kinds of vegetables to be planted in each row. Indicate on your plant the *North*, *South*, *East*, and *West* side. Use a separate sheet of paper and insert it in the book.

GENERAL CROP RECORD INFORMATION

SIZE OF PLOT: Length ______________ ft. Width ______________ft.

AREA OF PLOT IN SQ. FEET. ___________________________

TYPE OF SOIL ____
(sandy, sandy loam, clay, clay loam, gravel, etc.)

RAINFALL:

DATE:	INCHES:	DATE:	INCHES:
DATE:	INCHES:	DATE:	INCHES:

INSECTS:
Note type of insect, detail of damage, type of treatment:

____

____

WEEDS:
Note weeds found in your plot, their appearance as seedlings and a pressed sample:

____

____

DISEASES:
Mention the cause, symptoms, treatment, and prevention of disease.

____

____

OTHER DAMAGE:
Hail, Livestock, Frost, etc.

STORING PROCEDURES AND LOCATION OF STORAGE:

SPECIAL PREPARATION E.G. FERTILIZER:

SPECIAL CARE: E. G. SPRAYING, TRANSPLANTING:

VEGETABLE GROWTH RECORD

NAME AND VARIETY OF VEGETABLE

DATE OF PLANTING

DATE OF APPEARANCE

SPECIAL CARE - TRANSPLANTING

DATE OF HARVESTING

HOW VEGETABLE WAS STORED

HOW VEGETABLE WAS USED
- NEW IDEAS, RECIPES

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